



A.D. 1867, 22nd JANUARY. N° 158.

S P E C I F I C A T I O N

OF

WILLIAM ARENA MARTIN.

CONSUMING SMOKE AND FEEDING
FURNACES.

LONDON:

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A.D. 1867, *22nd JANUARY.* N° 158.

Consuming Smoke and Feeding Furnaces.

LETTERS PATENT to William Arena Martin, of 90, Cannon Street, in the City of London, Civil Engineer, for the Invention of “**IMPROVEMENTS IN APPARATUS FOR CONSUMING SMOKE, PROMOTING COMBUSTION, AND FEEDING FURNACES WITH FUEL.**”

Sealed the 12th July 1867, and dated the 22nd January 1867.

PROVISIONAL SPECIFICATION left by the said William Arena Martin at the Office of the Commissioners of Patents, with his Petition, on the 22nd January 1867.

I, WILLIAM ARENA MARTIN, of 90, Cannon Street, in the City of London,
5 Civil Engineer, do hereby declare the nature of the said Invention for “**IMPROVEMENTS IN APPARATUS FOR CONSUMING SMOKE, PROMOTING COMBUSTION, AND FEEDING FURNACES WITH FUEL,**” to be as follows:—

The Invention has for its objects improvements in the means of consuming smoke and of effecting combustion in the furnaces of steam boilers, as also
10 improvements in the means of supplying furnaces with fuel; for these purposes I employ a fire-door having a horizontal axle at the top, the said horizontal axle being supported by a bearing at each side on the side plates herein-after mentioned. By applying a lever to the said horizontle axle and working it the fire-door will open either inward or outward, and will thus

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either serve to push fuel into the fire or to admit air. The above-mentioned fire-door is cased or framed in by side plates, and has underneath it a curved plate on which the fuel rests while being pushed into the fire by the said fire-door; the front or greater part of the afore-mentioned curved plate is fixed on hinges or joints to the side plates herein-before mentioned. In 5 order to support the said curved plate I fix a piece of iron three sides of a square to the afore-mentioned side plates so as to swing under the curved plate; by removing this piece of iron the curved plate is made to drop on its hinges or joints. I propose also to use a hopper to contain the fuel when the aforesaid fire-door is used for supplying the furnace with fuel. Between 10 the said hopper and the afore-mentioned fire-door I place a valve or regulator to regulate the supply of fuel to the furnace; this valve or regulator is so fixed as to fall close when the hopper is empty; on each side of the said apparatus is a small door for the admission of air and fire-irons.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed 15 by the said William Arena Martin in the Great Seal Patent Office on the 20th July 1867.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, WILLIAM ARENA MARTIN, of 90, Cannon Street, in the City of London, Civil Engineer, send greeting. 20

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Twenty-second day of January, in the year of our Lord One thousand eight hundred and sixty-seven, in the thirtieth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said William Arena Martin, Her special license that I, the said William 25 Arena Martin, my executors, administrators, and assigns, or such others as I, the said William Arena Martin, my executors, administrators, and assigns, should in any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain 30 and Ireland, the Channel Islands, and Isle of Man, an Invention for "**IMPROVEMENTS IN APPARATUS FOR CONSUMING SMOKE, PROMOTING COMBUSTION, AND FEEDING FURNACES WITH FUEL,**" upon the condition (amongst others) that I, the said William Arena Martin, my executors or administrators, by an instrument in writing under my, or their, or one of their hands and seals, should 35

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particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

5 **NOW KNOW YE**, that I, the said William Arena Martin, do hereby declare the nature of my said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement :—

The Invention has for its objects improvements in the means of consuming
10 smoke, and of effecting more perfect combustion in the furnaces of steam boilers ; as also improvements in the means of supplying furnaces with fuel. For these purposes I employ a fire-door having a horizontal axle at the top, that is to say, that instead of the door being swung vertically it is swung horizontally, the said horizontal axle being supported by a bearing at each
15 side on the side plates herein-after mentioned. In addition, instead of the door having a flange or rebate, and the furnace front having a corresponding flange or rebate, or either the door or furnace front being thus provided, the door is so constructed and fixed in a frame or side plates that by applying a lever to the said horizontal axle, and working it, the door will open either inwards
20 or outwards, and will thus either by its inward movement serve to push fuel into the fire, or by either inward or outward movement to admit the quantity of air necessary to ensure perfect combustion, and thereby consumption of smoke. The above-mentioned fire-door is cased or framed in by side plates, or by a single plate, and has underneath it a curved plate, on which the fuel
25 rests while being pushed into the fire by the said fire-door. The front or greater part of the before-mentioned curved plate is fixed on hinges or joints to the side plates herein-before mentioned. In order to support the said curved plates I fix a piece of iron, three sides of a square, to the before-mentioned side plates, so as to swing under the curved plate ; by removing
30 this piece of iron the curved plate is made to drop on its hinges or joints. Instead of the curved hinged plate I in some cases use only a flat fixed plate which may form part of the frame of horizontally swung door. I propose also to use a hopper to contain the fuel when the herein-before mentioned fire-door is used for the purpose of supplying the furnace with
35 fuel ; between the said hopper and the herein-before mentioned fire-door I place a valve or regulator to regulate the supply of fuel to the furnace ; this valve or regulator is so fixed as to fall close when the hopper is empty ; on each side of the said apparatus is a small door for the admission of air and fire-irons.

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In order that the nature of the said Invention and the means by which I effect the same may be clearly understood and described I append to this Specification a Sheet of Drawings having figures and letters of reference marked thereupon, the same letters being used to denote similar parts in each Figure.

In these Drawings Figure 1 represents a sectional elevation of a furnace having my improved door, and Figure 2 is a perspective view of the door and its frame.

a is the horizontally swung door; *b* is the axle of same resting in the bearings *c*; and *d*, *d*, represent balance weights which maintain the door in any position in which the operator may, by means of the lever or levers *e* place it; in these views the herein-before mentioned flat fixed plates *f* only are used, the door not being used or employed as a feeder or means of pushing forward the fuel; *r*, *r*, are lugs for the purpose of thereby fixing the door and frame to furnace front.

Figures 3 and 4 show the application of my Invention with the curved plate *f*¹, as herein-before mentioned, on which the fuel is to rest, when the door is in addition employed as a feeder of the fuel to the furnace; this curved plate *f*¹ is fixed on hinges or joints *g*, *g*, so as to admit of its being placed in the position, as shewn, when it is desired to stoke the fire or rake out the same; this having been done the plate may be returned to its usual position (*f*², Figure 3), and is there securely held by means of a clipping piece or frame *h* on hinges or joints *i*, Figure 4; this clipping piece is represented by dotted lines in Figure 3. Figure 4 is a front elevation, and Figure 3 a sectional elevation of this arrangement, as described.

Figures 5 and 6 represent my Invention with the feeding hopper *j* and regulating valve *k*, as herein-before mentioned, for the purpose of regulating the supply of fuel to the furnace. The valve is provided at its under side with the rack *l* and a pinion *m* supported on a shaft *n* in bearings *o*, *o*; the valve can thus be moved to and fro by means of the lever *p*, so as to regulate the admission of the fuel. When this form of my apparatus is adopted I place small doors (*q*, *q*, Figure 6) at each side of the main door so as to allow of the use through them of the fire-irons, or to admit if necessary air.

Having now described and ascertained the nature of my Invention, and the means by which the same is effected, I wish it to be understood that what I claim is the construction and application and use of my improved door, as herein in this Specification described, and in the appended Drawings illustrated, used either simply by itself or with my curved feeding plates *f*¹, and without or with my improved hopper with regulating valve. I use the simple

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horizontally swung door merely for promoting the combustion of fuel and prevention of smoke, but when it is desired to use it for the purpose of passing fuel on to the fire I use therewith the curved feeding plates, and in some cases the hopper and valve for the purpose of regulating the supply of fuel.

5 In witness whereof, I, the said William Arena Martin, have hereunto set my hand and seal, this Twentieth day of July, in the year of our Lord One thousand eight hundred and sixty-seven.

WILLIAM ARENA MARTIN. (L.S.)

Witness,

10 J. HUDSON.

LONDON :

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Printers to the Queen's most Excellent Majesty. 1867.

FIG. 1.

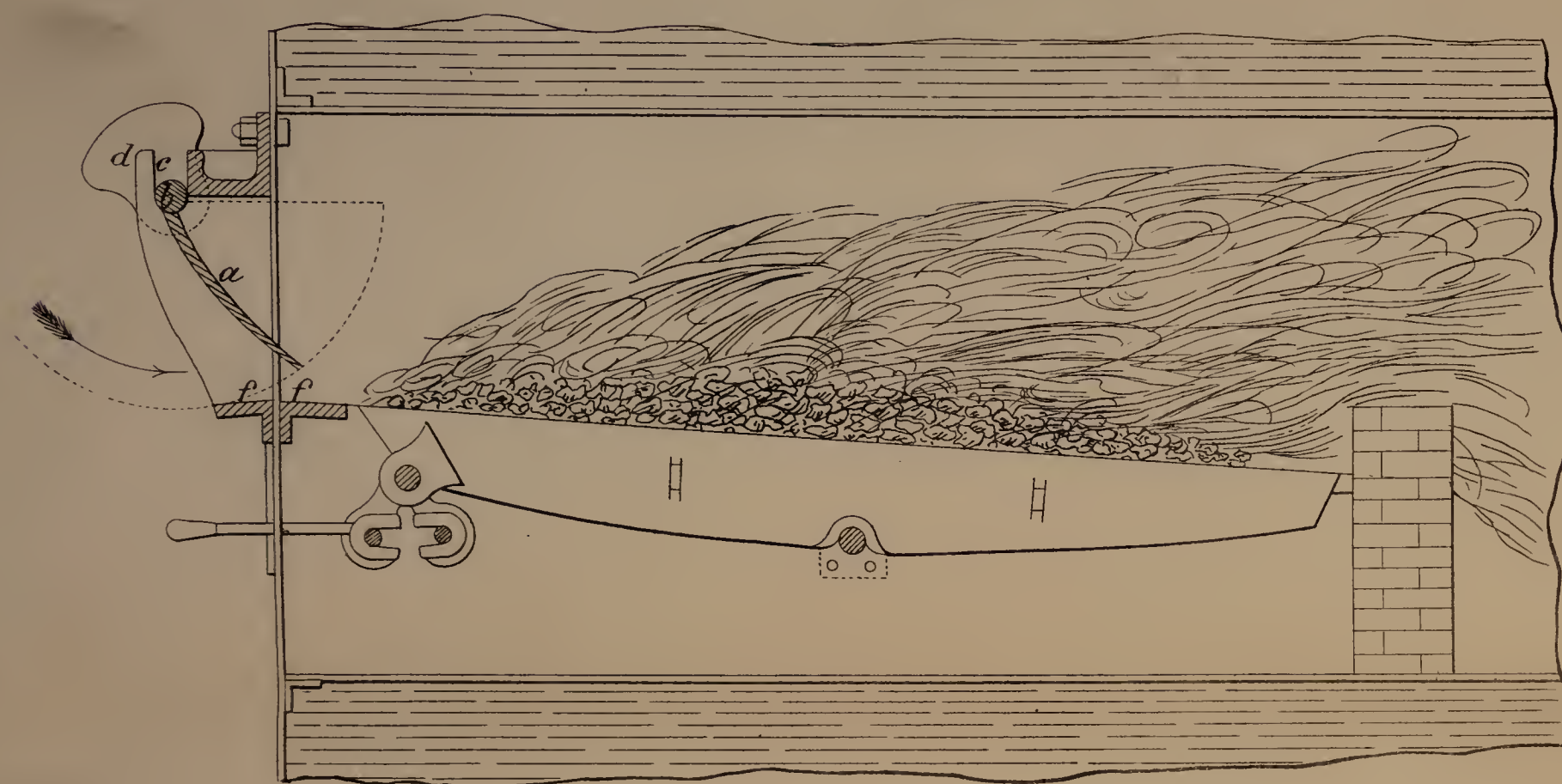


FIG. 2.

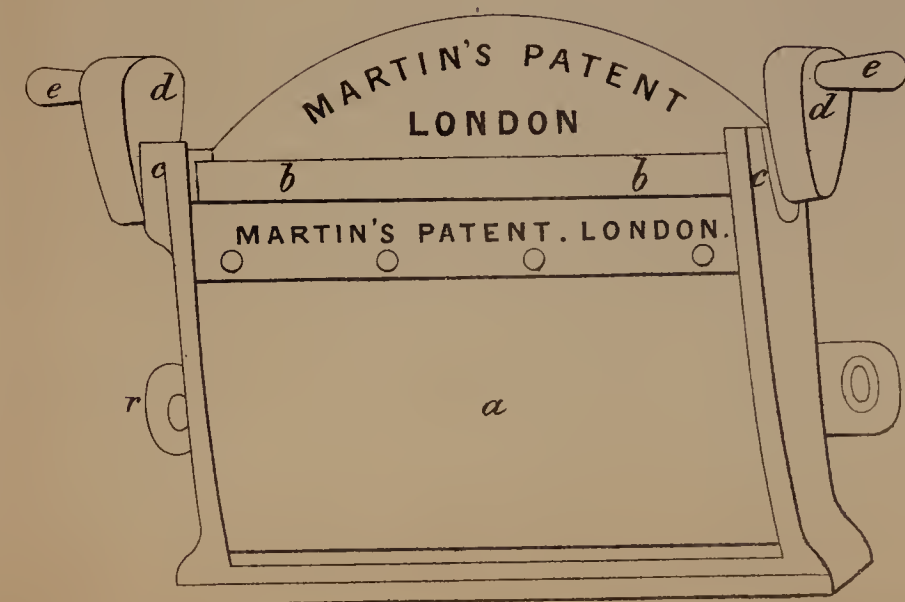


FIG. 3.

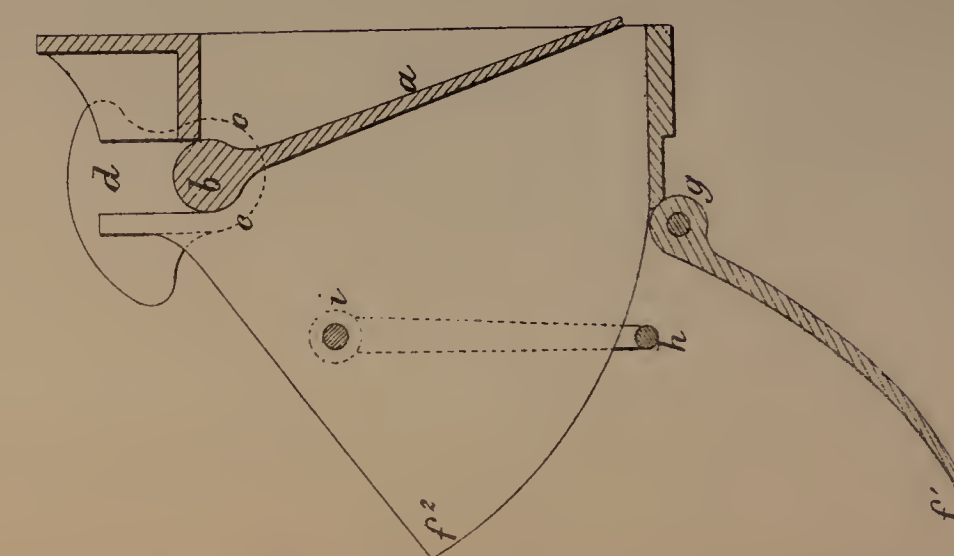


FIG. 6.

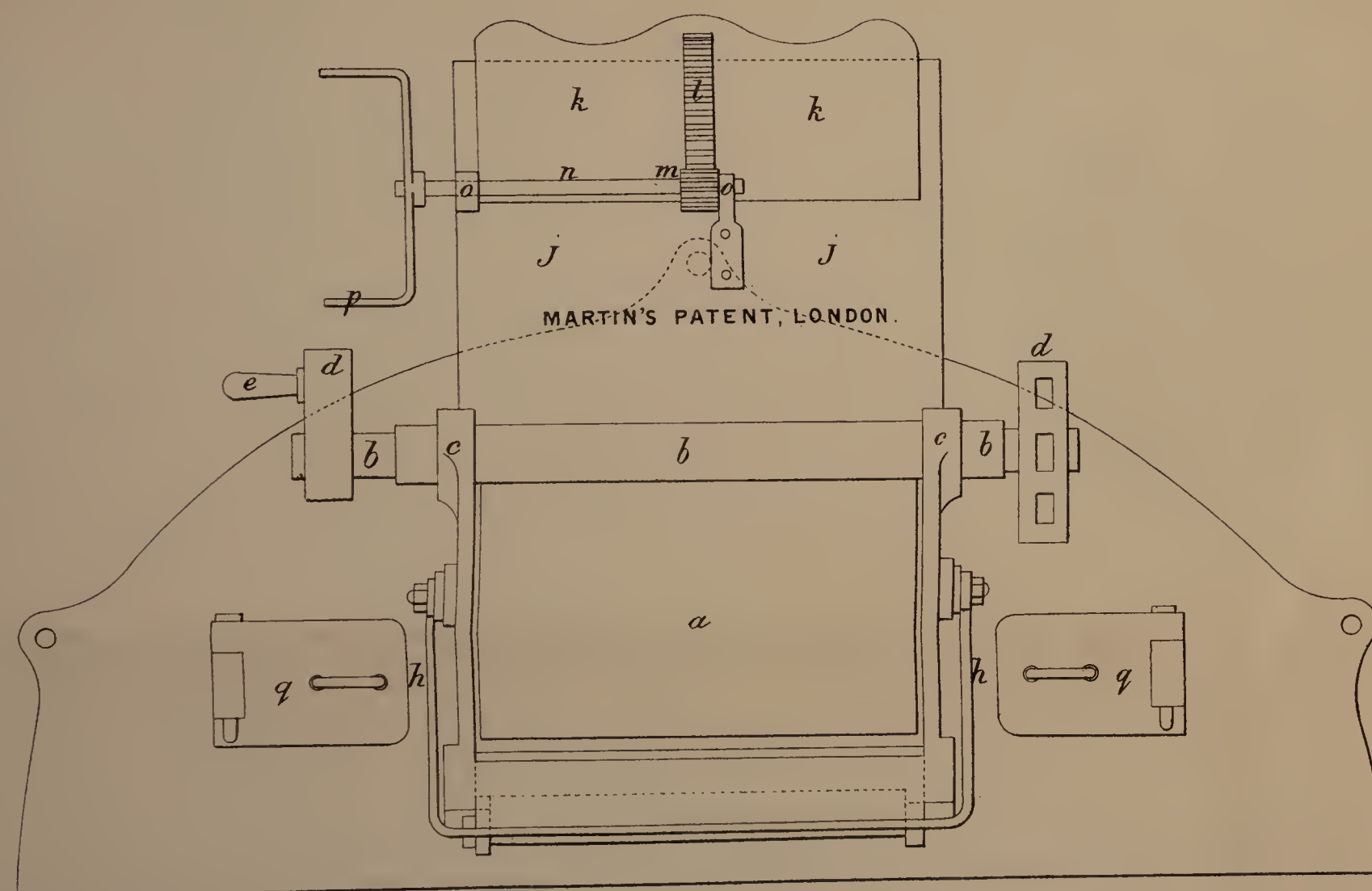


FIG. 5.

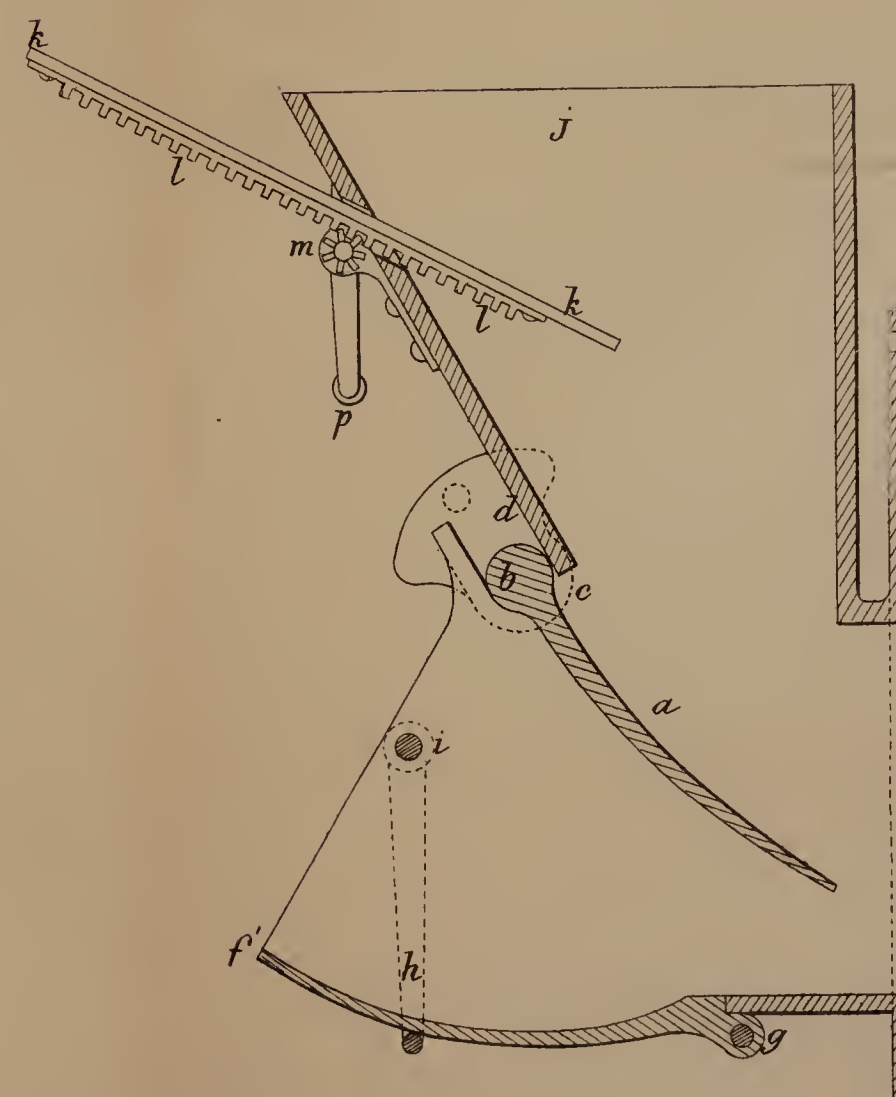
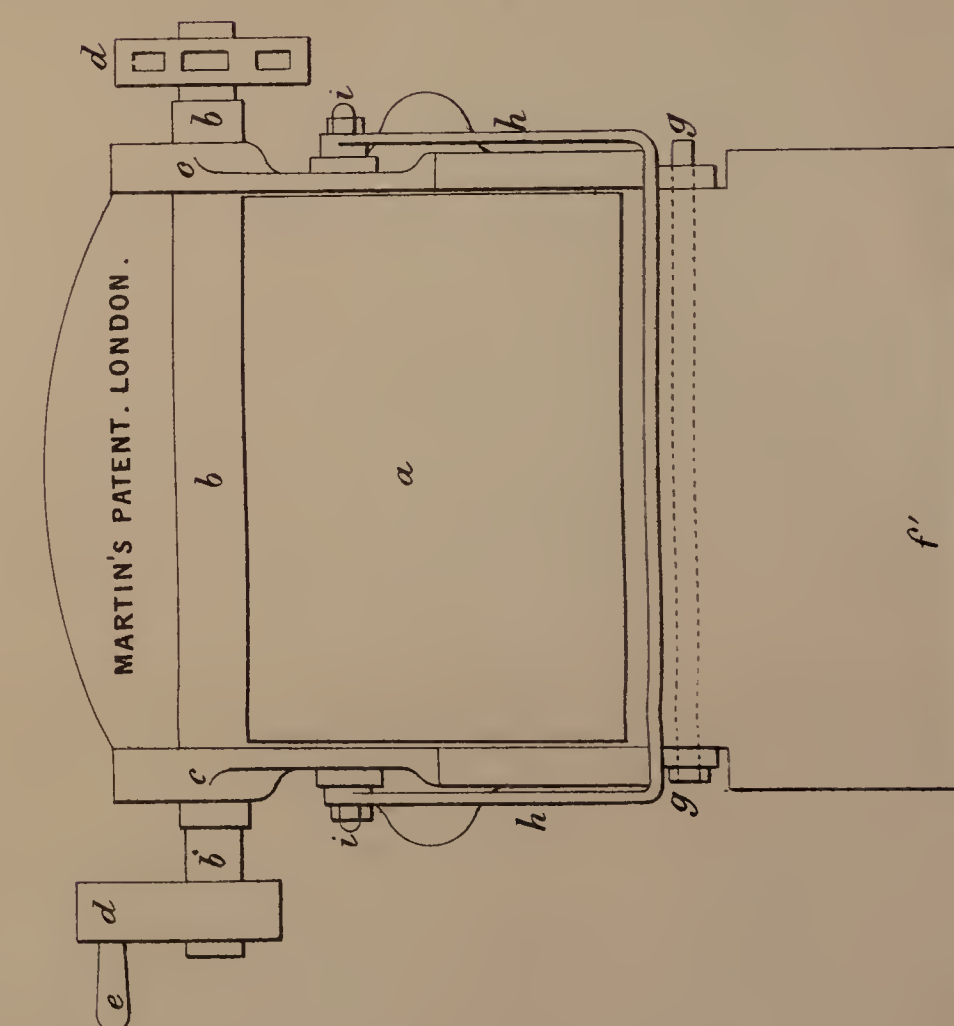


FIG. 4.



The filed drawing is partly colored

Drawn on Stone by Malby & Sons

